

UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION

Note

PATENT NO. : 7,157,993 B2

Page 1 of 3

APPLICATION NO.: 10/676,875

ISSUE DATE : January 2, 2007

INVENTOR(S) : Jeffrey F. DeNatale et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 9

Claim 26, line 67, change "MEN switches." to --MEM switches.--

Column 10

Claim 27, line 1, change "RE" to --RF--

Column 12

Claim 29, line 7, replace "at a given such that" with --at a given design frequency such that--

Claim 4 is cancelled.

Claim 20 is cancelled.

Claim 25 is cancelled.

Claim 27 is amended to read as follows:

An RF micro-electromechanical (MEM) phase shifter comprising first and second 1:4 MEM switch modules,

each of said switch modules comprising:  
a substrate,

a signal input line on said substrate for receiving a signal to be switched,  
said signal input line having a terminus point, and

four MEM switches on said substrate, each of said switches having an input contact and an output contact on said substrate which are separated by a gap, and a movable contact which provides an electrically continuous signal path between said input and output

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output contacts when said switch is actuated, each of said input contacts connected to said signal input line at said terminus point via respective switch input lines and each of said output contacts connected to respective signal output lines,

each of said MEM switches actuated with a respective drive voltage applied between said movable contact and at least one corresponding trace on said substrate, each of said corresponding traces connected to a via, said vias arranged symmetrically about said terminus point such that at least some of said vias are shared by adjacent ones of said MEM switches,

each of said switch input lines having an associated effective capacitance, said switch input lines arranged such that the inductance of each switch input line is matched to its effective capacitance at a given design frequency such that the impedance of each of said input lines is largely resistive at said design frequency, and

four transmission lines having different lengths, each of said transmission lines connected at one end to a respective one of the signal output lines of said first switch module and at the other end to a respective one of the signal output lines of said second switch module, said switch modules operated such that an input signal applied to the signal input line of one of said switch modules is routed to the signal input line of the other of said switch modules via one of said transmission lines such that said input signal is phase-shifted by predetermined amount and passes through two of said MEM switches.

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Claim 29 is amended to read as follows:

A 1:4 micro-electromechanical (MEM) switch module, comprising:  
a substrate,

a signal input line on said substrate for receiving a signal to be switched,  
said signal input line having a terminus point, and

four MEM switches on said substrate, each of said switches having an  
input contact and an output contact on said substrate which are separated by a gap, and a movable  
contact which provides an electrically continuous signal path between said input and output  
contacts when said switch is actuated, each of said input contacts connected to said signal input  
line at said terminus point via respective switch input lines and each of said output contacts  
connected to respective signal output lines,

said signal output lines routed away from said module on the side of said  
module opposite said fifth side, to facilitate the interconnection of said signal output lines,

each of said MEM switches actuated with a respective drive voltage  
applied between said movable contact and at least one corresponding trace on said substrate, each  
of said corresponding traces connected to a via, said vias arranged symmetrically about said  
terminus point such that at least some of said vias are shared by adjacent ones of said MEM  
switches,

each of said switch input lines having an associated effective  
capacitance, said switch input lines designed such that the inductance of each switch input line is  
matched to its effective capacitance at a given design frequency such that the impedance of each  
of said input lines is largely resistive at said design frequency.

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